Wetland Management and Lentic Amphibian Communities: The Role of Landscape Context, Hydrology, and Exotic Species

Ralph Thomas Rogers
Regional Wetland Ecologist
U.S. EPA Region 10, Office of Ecosystem, Tribal and Public Affairs (ETPA), Aquatic Resource Unit
(206) 553-4012
rogers.ralph@epa.gov

Authors: Ralph Thomas Rogers[1], Roseanne M. Lorenzana[2]
[1]U.S. EPA Region 10, ETPA Office, Aquatic Resource Unit
[2]U.S. EPA Region 10, Office of Environmental Assessment

Keywords: wetland, amphibian, non-native, hydrology, restoration

In the past two decades, scientists around the world have increasingly noted losses of amphibian populations. Although declines have been noted in wilderness populations, it is particularly chronic in multiple-use landscapes, such as the Willamette Valley (WV) in western Oregon. Known threats to amphibians in the WV include habitat loss, habitat alteration, and three non-native taxa: fish, bullfrogs, and crayfish.

This study was a joint research effort conducted cooperatively by scientists at the U.S. Environmental Protection Agency (U.S. EPA)/Western Ecology Division and the U.S. Geological Survey (USGS), Biological Resources Division/Forest and Rangeland Ecosystem Science Center. The study evaluated the relationships between amphibian communities and hydrology, exotic predators, and landscape context in the WV. The purpose of the study was to (1) examine regional patterns in amphibian communities of managed and naturally occurring wetlands and (2) elucidate the influences of site-level and landscape-level wetland characteristics on lentic community composition in the lowlands of western Oregon. This research provided valuable insight for regional wetlands mitigation projects and efforts by the U.S. EPA to maintain aquatic biodiversity. The habitat classification and population models produced by this project are applicable to similar wetland systems in the western United States.

One of the key results of the study was a set of recommendations on mitigation design. Those recommendations are now being used by state (Oregon Division of State Lands) and federal (U.S. Army Corps of Engineers) regulatory agencies as part of their mitigation design guidance. In addition, the USGS has produced a number of outreach materials to provide greater awareness to wetland/aquatic restoration practitioners in Washington and Oregon of the study results. Although the study focused on the WV in Oregon, many of the same conclusions apply to wetlands in the Puget Sound Trough.